EXECUTIVE SUMMARY

Purpose and Authority

This integrated feasibility report and Environmental Impact Statement (EIS) documents the results of a feasibility study for proposed improvements to the authorized Columbia and lower Willamette Rivers navigation channel in Oregon and Washington. The channel is currently authorized at a 40-foot depth and generally a 600-foot width. The study area for improvements covers 11.6 miles of the Willamette River below Portland, Oregon and 103.5 miles of the Columbia River, from river mile 3 to 106.5, below Vancouver, Washington.

The study was authorized by a resolution of the U.S. House of Representatives, Committee on Public Works and Transportation, adopted August 3, 1989. The feasibility study was initiated in 1994 and is co-sponsored by the U.S. Army Corps of Engineers and seven lower Columbia River ports: Astoria, St. Helens, and Portland in Oregon and Longview, Kalama, Woodland, and Vancouver in Washington. The Port of Portland serves as the overall coordinator for the sponsoring ports. The U.S. Environmental Protection Agency (EPA), Region 10 in Seattle, Washington, is a cooperating agency for this report.

The purposes of the study are to improve the deep-draft transport of goods on the authorized navigation channel and to provide ecosystem restoration for fish and wildlife habitats. The need for navigation improvements has been driven by the steady growth in waterborne commerce and the use of larger, more efficient vessels to transport bulk commodities. With the increased use of deep-draft vessels, limitations posed by the existing channel dimensions now occur with greater frequency. By improving navigation, the opportunity to realize greater benefits would result from reducing transportation costs by allowing deep-draft vessels to carry more tonnage, and by reducing vessel delays.

The report also includes documentation in support of EPA designation of new ocean disposal sites for maintenance of the Mouth of the Columbia River project, the existing Columbia and Lower Willamette River navigation channel, and construction/maintenance of proposed channel improvements.

Planning constraints recognized that channel improvement alternatives were limited to a maximum of 3 feet of deepening by the study's authorizing legislation. Also, it was directed that the *Dredged Material Management Plan* (1998) would serve as the no action alternative for the study. This plan evaluated the most efficient way to maintain the currently authorized 40-foot navigation channel in the future.

Proposed Action and Alternatives

Alternatives for improving deep-draft navigation, as well as any dredging and disposal actions needed for construction and maintenance, were formulated and evaluated on the basis of technical, economic, social, and environmental criteria. A range of alternatives was considered. Besides the no action alternative, a non-structural alternative to upgrade the existing river stage forecasting system, LoadMax, to improve navigation was evaluated. During the course of this study many improvements have been made to the

LoadMax alternative by the National Weather Service Northwest River Forecast Center as well as advances in website access to real-time river level data. LoadMax improvements alone will only serve in marginal increases in safety and minimum vessel drafts. They will not serve as an alternative to deepening the channel from the perspective of the deep draft navigation users and therefore are not an acceptable alternative to deepening the channel to 43 feet. Future upgrades, including the addition of bathymetric information, are being planned. It is estimated that future improvements to the river stage forecast system would be implemented as part of the day-to-day operations under the with- or without a new project. Also, as a result of public comments for reducing the environmental impacts associated with dredging, regional port concepts were formulated to locate deep-draft facilities closer to the mouth of the Columbia River. These concepts, however, were dropped from further consideration because of the high costs associated with construction, transportation, port facility, environmental impacts, and lack of support by the non-Federal sponsors.

Three structural channel deepening alternatives were considered that alter the channel's configuration and/or depth by 41, 42, or 43 feet to improve deep-draft vessel transport. These alternatives would be similar and require dredging and disposal alternatives for construction and maintenance. The construction of the 41-, 42-, and 43-foot channels requires dredging 6, 12, and 20 million cubic yards (mcy) of sandy material from the channel, respectively. The depth and width of the dredge cut would vary with location.

Construction of the 43-foot channel would also require the removal of 220,000 cubic yards of hard basalt rock and 450,000 cubic yards of cemented sand, gravel and boulders at four areas in the Columbia River and two in the Willamette River. Basalt is present at two areas at CRM 87 and WRMs 3 to 7. A softer, consolidated rock occurs at CRMs 63 to 67, CRM 105 and WRMs 10 to 11. An area with an unknown type of rock (probably basalt) is located at CRM 98. There is a high likelihood that rock in the basalt areas was fractured during the construction of the 40-foot channel. Mechanical methods such as a large clamshell dredge would be tried to see if the rock could be removed. Underwater blasting would need to be done in areas where mechanical methods are unsuccessful. Excavated rock will be placed in upland disposal sites.

The amount of in-water disposal for the 43-foot channel alternative would be less than for the existing 40-foot channel. Most of the shift would be from in-water to upland disposal sites. Existing channel maintenance inwater disposal would total an estimated 80 mcy over the next 50 years. Projected inwater disposal for maintenance of the proposed 43-foot channel is 54 mcy over the 50-year project life.

The amount of dredged material estimated for ocean disposal for the 43-foot channel alternative is estimated at 7 mcy from construction and a total of 9 mcy for maintenance over 20 years. This would be in addition to the existing average annual ocean disposal of 4.5 mcy from the Mouth of the Columbia River project.

Specific environmental and engineering criteria were developed for screening the upland disposal sites. The mix of disposal sites would primarily distinguish the disposal

alternatives rather than the availability of dredges (hopper, pipeline, or clamshell). The proposed disposal plan represents a composite of the least cost and sponsor preferred alternative evaluated in the draft report. The proposed disposal alternative would use a total of 29 upland disposal sites, with a total land area of 1681 acres. Material placement would range from 30 to 45 feet high. Fourteen of these sites, totaling 1,025 acres, are included in the no action alternative, of the remaining 15 sites only 4 upland sites and the Lonestar Gravel Pit have never been used for dredged material disposal in the past. Twelve of the remaining 15 sites are upstream of Longview, in a reach of the river that would typically be maintained using in-water disposal. The current land uses at the 15 sites not included in the no action alternative are: 4 agricultural sites, 9 industrial sites; and 2 would be defined as other land use. The proposed disposal alternative would result in the direct loss of 200 acres of agricultural lands, 67 acres of riparian habitat, and 20 acres of wetland habitat. Wildlife mitigation actions are recommended to offset these habitat losses.

Sediment in the Columbia River navigation channel is primarily sand with a low percent of organic content. This sediment would be suitable, based on EPA and Corps criteria, for unconfined in-water and upland disposal. The material currently dredged for maintenance of the Willamette channel has also been found suitable for unconfined in-water disposal. However, some material in the Willamette River has been found to be potentially unsuitable for in-water disposal unless further biological tests are conducted.

The local sponsors for the proposed project have requested that dredging the Willamette River be delayed in order to allow coordination with the ODEQ investigation and remediation planning for the Portland Harbor. This will delay construction of the Willamette River portion to insure that final implementation decisions incorporate both the investigation results and remediation plan. Any deepening of the Willamette River channel will consider the remediation plan.

Dredging of the Willamette River channel will require full compliance with all laws including the Clean Water Act, Endangered Species Act, and the National Environmental Policy Act. In addition, ODEQ will be asked to certify compliance with water quality standards for the Oregon portion of the project separately from certification of the Willamette River portion. Certification of the Willamette River portion will not occur until after the ODEQ remediation plan has been completed.

Deepening the channel to 43-feet was found to maximize net benefits. This alternative is selected as the proposed action for federal implementation. The fully funded cost estimate for the proposed action, including the environmental restoration component, is $195,930,000.

In conjunction with the proposed action, channel optimization measures were investigated to increase navigation safety or reduce the amount of construction and maintenance dredging. Turning basins, anchorages, and berthing areas were also analyzed in terms of adequacy of dimension and usefulness.

An environmental restoration component resulting from a series of workshops with federal and state resource agencies and the public is also proposed for implementation. Its scope consists of restoring the hydraulic connection between the Columbia River and Shillapoo Lake and fisheries habitat restoration measures. These elements were selected from a long list of potential actions as being the most appropriate to implement as a component of the proposed action.

Changes in the Proposed Action From Draft EIS to Final EIS

Actions which were described in the Draft EIS which have been revised in the Final EIS include: phasing new dredging of the Willamette River channel pending the outcome of the State of Oregon's Portland Harbor Sediment Management Plan; modifying disposal site locations to further minimize wetland impacts; substantially revising the size and location of proposed ocean disposal sites; elimination of the Miller-Pillar inwater disposal and pile dikes from the environmental restoration proposal, and revised economic commodity projections for container ships.

Summary of Impacts

The channel deepening alternatives result in incrementally greater physical impacts with increasing depth. Maintenance dredging would shift dramatically from in-water to upland disposal. Dredging a deeper channel would lead to very slight increases in estuarine salinity under low river flow conditions. Estuarine circulation would essentially be unchanged. Overall sediment budget or sedimentation patterns would not change to any perceptible degree. Water quality impacts would increase in the short term from dredging a deeper channel. Long term water quality impacts may actually decrease as less material would be disposed of in in-water locations. Shoreline erosion from currents, wind waves, and ship wake is expected to remain near current levels.

Three salinity workshops were held with state and federal resource agencies to determine the effects of channel deepening on salinity and estuarine organisms. It was concluded at the workshops that no significant biological impact would result from salinity changes predicted for the proposed channel deepening.

Biological impacts from dredging a deeper channel would include impacting more benthic habitat. However, most of this habitat is at depths greater than 35 feet and is not considered highly productive. In general, reducing the amount of in-water disposal would result in less impact to aquatic organisms. Increased use of upland disposal would result in additional impacts to wildlife habitat. A mitigation plan is proposed to offset any habitat losses.

Increased ocean disposal of dredged material would result in increased impacts to marine organisms while decreasing impacts to estuarine organisms. Based on studies evaluating the effects of current ocean disposal practices, and the site review and evaluation process conducted by the agency and fishing industry Ocean Disposal Working Group, these impacts are not expected to be significant. The ocean disposal site selection process and impact evaluation are detailed in Appendix H.

Twenty-two federally listed threatened and endangered wildlife, plant and invertebrate species may occur in the study area. The proposed channel improvement project is not expected to adversely impact most of these species. For Columbian white-tailed deer, however, conservation measures (seeding of grasses and forbs to provide forage) were recommended on four upland disposal sites to offset impacts to this species.

For the Columbia River, there are currently 12 listed and one proposed for listing salmonid species under the Endangered Species Act. Listed stocks include the Snake River fall and spring/summer runs of chinook, Snake River run of sockeye, and the upper and lower Columbia and Snake River runs of steelhead, upper and lower Columbia and upper Willamette runs of chinook, chum below Bonneville Dam, and the mid-Columbia and upper Willamette runs of steelhead. The proposed species is coastal cut-throat troat. Deepening the navigation channel would not be expected to have greater impacts to these salmonids than the existing maintenance dredging program.

The deepening alternatives would result in minor impacts to aesthetics, recreation, and land use. Using more upland disposal would modify aesthetic values from primarily a rural farm condition to mounds of bare sand. Recreation impacts would result from increased upland disposal, adversely affecting activities such as wildlife viewing. Land use at new disposal sites would change from agricultural/open space to dredged material disposal. No cultural resources would be impacted by dredging or disposal actions.

Based upon the evaluation of the criteria contained in 40 CFR Parts 220 through 228, the Corps and EPA have determined that the ocean dredged material disposal sites proposed in the DEIS (North Site, South Site, and Site E) and the Deep Water Site are suitable for designation and use as disposal sites for ocean dumping of dredged material when disposal and site management is performed in accordance with the management and monitoring plan which as been developed under 40 CFR 228.9 and use restrictions that will be specified as part of designation. The Corps and EPA have further determined that material dredged from the MCR, Columbia River channel and channel deepening (if authorized) projects meet the criteria for dredged material dumping. The North Site and South Site proposed in the DEIS are no longer under consideration for designation and use by the federal government. Site E and the Deep Water Site are proposed for designation by EPA through formal rulemaking, adopting the appropriate sections of this EIS and appendices to support that action. These two new ocean dredged material disposal sites will be used and managed in association with the existing North Jetty Site located adjacent to Site E but in jurisdictional Inland Waters rather than Ocean Waters. The four Columbia River ocean dredged material disposal sites originally designated by EPA in 1986 will be de-designated as part of the rulemaking package for the new sites. The sites selected by the Corps under their Section 103 authority in 1993 and 1997 will expire at the end of their authorized life or will be terminated once EPA's formal rulemaking is completed.